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|------------------------|--|-----------------------|
| Attorney Docket No.    |  | MERCK-2791            |
| First Inventor         |  | HEENEY, Martin, et al |
| Title                  | MONO-, OLIGO- AND POLY-BIS(THIENYL) ARYLENES AND THEIR USE AS CHARGE TRANSPORT MATERIALS |                       |
| Express Mail Label No. |  |                       |

*(Only for new nonprovisional applications under 37 C.F.R. 1.53(b))*

ADDRESS TO:

Assistant Commissioner for Patents  
Box Patent Application  
Washington, DC 20231

*See MPEP chapter 600 concerning utility patent application contents.*

1. ☒ **Fee Transmittal Form (e.g., PTO/SB/17)**  
(Submit an original and a duplicate for fee processing)
2. ☐ **Applicant claims small entity status.**  
See 37 CFR 1.27.
3. ☒ **Specification** [Total Pages  ]  
(preferred arrangement set forth below)
- Descriptive title of the Invention
  - Cross References to Related Applications
  - Statement Regarding Fed sponsored R & D
  - Reference to sequence listing, a table, or a computer program listing appendix
  - Background of the Invention
  - Brief Summary of the Invention
  - Brief Description of the Drawings ( if filed)
  - Detailed Description
  - Claim(s)
  - Abstract of the Disclosure
4. ☐ **Drawing(s) (35 U.S.C. 113)** [Total Sheets  ]
5. **Oath or Declaration** [Total Pages  ]
- a. ☒ **Newly executed (original or copy)**
- b. ☐ **Copy from a prior application (37 CFR 1.63 (d))**  
(for a continuation/divisional with Box 18 completed)
- i. ☐ **DELETION OF INVENTOR(S)**  
Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. ☐ **Application Data Sheet. See 37 CFR 1.76**

7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (*Appendix*)
8. Nucleotide and/or Amino Acid Sequence Submission (*if applicable, all necessary*)
- a. ☐ Computer Readable Form (CRF)
- b. Specification Sequence Listing on:
- i. ☐ CD-ROM or CD-R (2 copies); or
- ii. ☐ paper
- c. ☐ Statements verifying identity of above copies

## ACCOMPANYING APPLICATIONS PARTS

9. ☒ Assignment Papers (cover sheet & document(s))
10. ☐ 37 C.F.R. § 3.73(b) Statement ☐ Power of Attorney  
(when there is an assignee)
11. ☐ English Translation Document (if applicable)
12. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations
13. ☒ Preliminary Amendment
14. ☒ Return Receipt Postcard (MPEP 503)  
(Should be specifically itemized)
15. ☒ Certified Copy of Priority Document(s)  
(if foreign priority is claimed)
16. ☐ Request and Certification under 35 U.S.C. 122  
(b)(2)(B)(i). Applicant must attach form PTO/SB/35  
or its equivalent.
17. ☐ Other:

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment, or in an Application Data Sheet under 37 CFR 1.76:

☐ Continuation      ☐ Divisional      ☐ Continuation-in-part (CIP)

of prior application No: /

**Prior application information:**

**Examiner**

Group / Art Unit:

For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

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3 DECEMBER 2003

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120303

13281 U.S. PTO

PTO/SB/17 (11-00)

Approved for use through 10/31/2002. OMB 0651-0032

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for FY 2003**

Patent fees are subject to annual revision.

Complete if Known

|                      |  |                       |  |
|----------------------|--|-----------------------|--|
| Application Number   |  |                       |  |
| Filing Date          |  | 3 DECEMBER 2003       |  |
| First Named Inventor |  | HEENEY, Martin, et al |  |
| Examiner Name        |  |                       |  |
| Group / Art Unit     |  |                       |  |
| Attorney Docket No.  |  | MERCK-2791            |  |

|                         |      |     |
|-------------------------|------|-----|
| TOTAL AMOUNT OF PAYMENT | (\$) | 914 |
|-------------------------|------|-----|

| METHOD OF PAYMENT (check one)   |                       | FEE CALCULATION (continued)  |                       |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
|---|-----------------------|--|-----------------------|-----------------|-----------------------|-----------------------|-----------------|------------------------|------|------|------|-----------------------------------|--|------|------|---------------------------------------|----|------|------|--|------|------|------|--|-------|------|-------|--|------|------|------|------|--|------|--------|------|--------|--|------|-----|------|----|--|------|-----|------|-----|--|------|-----|------|-----|--|------|-------|------|-----|--|------|-------|------|-----|--|------|-----|------|-----|--|------|-----|------|-----|--|------|-----|------|-----|--|------|-------|------|-------|--|------|-----|------|----|--|------|-------|------|-----|--|-----|-------|-----|-----|--|------|-----|------|-----|--|------|-----|------|-----|--|------|-----|------|-----|--|------|-----|------|-----|--|------|-----|------|-----|--|------|----|------|----|--|------|-----|------|-----|--|------|-----|------|-----|--|------|-----|------|-----|--|------|-----|------|-----|--|
| <p>1. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:</p> <p>Deposit Account Number: 13-3402</p> <p>Deposit Account Name: Millen, White, Zelano &amp; Branigan, P.C.</p> <p><input checked="" type="checkbox"/> Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17</p> <p><input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27</p>   |                       | <p>3. ADDITIONAL FEES</p> <table border="1"><thead><tr><th>Fee Code</th><th>Large Entity Fee (\$)</th><th>Small Entity Fee (\$)</th><th>Fee Description</th><th>Fee Paid</th></tr></thead><tbody><tr><td>1051</td><td>130</td><td>2051</td><td>65</td><td></td></tr><tr><td>1052</td><td>50</td><td>2052</td><td>25</td><td></td></tr><tr><td>1053</td><td>130</td><td>1053</td><td>130</td><td></td></tr><tr><td>1812</td><td>2,520</td><td>1812</td><td>2,520</td><td></td></tr><tr><td>1804</td><td>920*</td><td>1804</td><td>920*</td><td></td></tr><tr><td>1805</td><td>1,840*</td><td>1805</td><td>1,840*</td><td></td></tr><tr><td>1251</td><td>110</td><td>2251</td><td>55</td><td></td></tr><tr><td>1252</td><td>410</td><td>2252</td><td>205</td><td></td></tr><tr><td>1253</td><td>930</td><td>2253</td><td>465</td><td></td></tr><tr><td>1254</td><td>1,450</td><td>2254</td><td>725</td><td></td></tr><tr><td>1255</td><td>1,970</td><td>2255</td><td>985</td><td></td></tr><tr><td>1401</td><td>320</td><td>2401</td><td>160</td><td></td></tr><tr><td>1402</td><td>320</td><td>2402</td><td>160</td><td></td></tr><tr><td>1403</td><td>280</td><td>2403</td><td>140</td><td></td></tr><tr><td>1451</td><td>1,510</td><td>1451</td><td>1,510</td><td></td></tr><tr><td>1452</td><td>110</td><td>2452</td><td>55</td><td></td></tr><tr><td>1453</td><td>1,300</td><td>2453</td><td>650</td><td></td></tr><tr><td>142</td><td>1,300</td><td>242</td><td>650</td><td></td></tr><tr><td>1502</td><td>470</td><td>2502</td><td>235</td><td></td></tr><tr><td>1503</td><td>630</td><td>2503</td><td>315</td><td></td></tr><tr><td>1460</td><td>130</td><td>1460</td><td>130</td><td></td></tr><tr><td>1807</td><td>130</td><td>1807</td><td>130</td><td></td></tr><tr><td>1806</td><td>180</td><td>1806</td><td>180</td><td></td></tr><tr><td>8021</td><td>40</td><td>8021</td><td>40</td><td></td></tr><tr><td>1809</td><td>750</td><td>2809</td><td>375</td><td></td></tr><tr><td>1810</td><td>750</td><td>2810</td><td>375</td><td></td></tr><tr><td>1801</td><td>750</td><td>2801</td><td>375</td><td></td></tr><tr><td>1802</td><td>900</td><td>1802</td><td>900</td><td></td></tr></tbody></table> |                       | Fee Code        | Large Entity Fee (\$) | Small Entity Fee (\$) | Fee Description | Fee Paid               | 1051 | 130  | 2051 | 65                                |  | 1052 | 50   | 2052                                  | 25 |      | 1053 | 130  | 1053 | 130  |      | 1812   | 2,520 | 1812 | 2,520 |  | 1804 | 920* | 1804 | 920* |  | 1805 | 1,840* | 1805 | 1,840* |  | 1251 | 110 | 2251 | 55 |  | 1252 | 410 | 2252 | 205 |  | 1253 | 930 | 2253 | 465 |  | 1254 | 1,450 | 2254 | 725 |  | 1255 | 1,970 | 2255 | 985 |  | 1401 | 320 | 2401 | 160 |  | 1402 | 320 | 2402 | 160 |  | 1403 | 280 | 2403 | 140 |  | 1451 | 1,510 | 1451 | 1,510 |  | 1452 | 110 | 2452 | 55 |  | 1453 | 1,300 | 2453 | 650 |  | 142 | 1,300 | 242 | 650 |  | 1502 | 470 | 2502 | 235 |  | 1503 | 630 | 2503 | 315 |  | 1460 | 130 | 1460 | 130 |  | 1807 | 130 | 1807 | 130 |  | 1806 | 180 | 1806 | 180 |  | 8021 | 40 | 8021 | 40 |  | 1809 | 750 | 2809 | 375 |  | 1810 | 750 | 2810 | 375 |  | 1801 | 750 | 2801 | 375 |  | 1802 | 900 | 1802 | 900 |  |
| Fee Code  | Large Entity Fee (\$) | Small Entity Fee (\$)  | Fee Description       | Fee Paid        |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1051  | 130                   | 2051   | 65                    |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1052  | 50                    | 2052   | 25                    |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1053  | 130                   | 1053   | 130                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1812  | 2,520                 | 1812   | 2,520                 |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1804  | 920*                  | 1804   | 920*                  |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1805  | 1,840*                | 1805   | 1,840*                |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1251  | 110                   | 2251   | 55                    |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1252  | 410                   | 2252   | 205                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1253  | 930                   | 2253   | 465                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1254  | 1,450                 | 2254   | 725                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1255  | 1,970                 | 2255   | 985                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1401  | 320                   | 2401   | 160                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1402  | 320                   | 2402   | 160                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1403  | 280                   | 2403   | 140                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1451  | 1,510                 | 1451   | 1,510                 |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1452  | 110                   | 2452   | 55                    |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1453  | 1,300                 | 2453   | 650                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 142   | 1,300                 | 242  | 650                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1502  | 470                   | 2502   | 235                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1503  | 630                   | 2503   | 315                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1460  | 130                   | 1460   | 130                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1807  | 130                   | 1807   | 130                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1806  | 180                   | 1806   | 180                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 8021  | 40                    | 8021   | 40                    |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1809  | 750                   | 2809   | 375                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1810  | 750                   | 2810   | 375                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1801  | 750                   | 2801   | 375                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1802  | 900                   | 1802   | 900                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| <p>2. <input checked="" type="checkbox"/> Payment Enclosed:</p> <p><input checked="" type="checkbox"/> Check <input type="checkbox"/> Credit card <input type="checkbox"/> Money Order <input type="checkbox"/> Other</p>   |                       |  |                       |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| <p><b>FEE CALCULATION</b></p> <p>1. BASIC FILING FEE</p> <table border="1"><thead><tr><th>Large Entity Fee Code</th><th>Small Entity Fee Code</th><th>Fee Description</th><th>Fee Paid</th></tr></thead><tbody><tr><td>1001</td><td>2001</td><td>Utility filing fee</td><td>770</td></tr><tr><td>1002</td><td>2002</td><td>Design filing fee</td><td></td></tr><tr><td>1003</td><td>2003</td><td>Plant filing fee</td><td></td></tr><tr><td>1004</td><td>2004</td><td>Reissue filing fee</td><td></td></tr><tr><td>1005</td><td>2005</td><td>Provisional filing fee</td><td></td></tr></tbody></table> <p>SUBTOTAL (1) (\$ 770)</p>   |                       | Large Entity Fee Code  | Small Entity Fee Code | Fee Description | Fee Paid              | 1001                  | 2001            | Utility filing fee     | 770  | 1002 | 2002 | Design filing fee                 |  | 1003 | 2003 | Plant filing fee                      |    | 1004 | 2004 | Reissue filing fee                                 |      | 1005 | 2005 | Provisional filing fee                                     |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| Large Entity Fee Code   | Small Entity Fee Code | Fee Description  | Fee Paid              |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1001  | 2001                  | Utility filing fee   | 770                   |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1002  | 2002                  | Design filing fee  |                       |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1003  | 2003                  | Plant filing fee   |                       |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1004  | 2004                  | Reissue filing fee   |                       |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1005  | 2005                  | Provisional filing fee   |                       |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| <p>2. EXTRA CLAIM FEES</p> <p>Total Claims: 28 -20** = 8 X Fee from below: 18 = Fee Paid: 144</p> <p>Independent Claims: 3 -3** = 0 X Fee from below: 0 = Fee Paid: 0</p> <p>Multiple Dependent: X Fee from below: 0 = Fee Paid: 0</p> <table border="1"><thead><tr><th>Large Entity Fee Code</th><th>Small Entity Fee Code</th><th>Fee Description</th><th>Fee Paid</th></tr></thead><tbody><tr><td>1202</td><td>2202</td><td>Claims in excess of 20</td><td></td></tr><tr><td>1201</td><td>2201</td><td>Independent claims in excess of 3</td><td></td></tr><tr><td>1203</td><td>2203</td><td>Multiple dependent claim, if not paid</td><td></td></tr><tr><td>1204</td><td>2204</td><td>** Reissue independent claims over original patent</td><td></td></tr><tr><td>1205</td><td>2205</td><td>** Reissue claims in excess of 20 and over original patent</td><td></td></tr></tbody></table> <p>SUBTOTAL (2) (\$ 144)</p> |                       | Large Entity Fee Code  | Small Entity Fee Code | Fee Description | Fee Paid              | 1202                  | 2202            | Claims in excess of 20 |      | 1201 | 2201 | Independent claims in excess of 3 |  | 1203 | 2203 | Multiple dependent claim, if not paid |    | 1204 | 2204 | ** Reissue independent claims over original patent |      | 1205 | 2205 | ** Reissue claims in excess of 20 and over original patent |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| Large Entity Fee Code   | Small Entity Fee Code | Fee Description  | Fee Paid              |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1202  | 2202                  | Claims in excess of 20   |                       |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1201  | 2201                  | Independent claims in excess of 3  |                       |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1203  | 2203                  | Multiple dependent claim, if not paid  |                       |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1204  | 2204                  | ** Reissue independent claims over original patent   |                       |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| 1205  | 2205                  | ** Reissue claims in excess of 20 and over original patent   |                       |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |
| <p>**or number previously paid, if greater; For Reissues, see above</p>   |                       | <p>Other fee (specify) _____</p> <p>*Reduced by Basic Filing Fee Paid</p> <p>SUBTOTAL (3) (\$ 0)</p>   |                       |                 |                       |                       |                 |                        |      |      |      |                                   |  |      |      |                                       |    |      |      |  |      |      |      |  |       |      |       |  |      |      |      |      |  |      |        |      |        |  |      |     |      |    |  |      |     |      |     |  |      |     |      |     |  |      |       |      |     |  |      |       |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |       |      |       |  |      |     |      |    |  |      |       |      |     |  |     |       |     |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |    |      |    |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |      |     |      |     |  |

| SUBMITTED BY      |                 | Complete (if applicable)        |                 |           |                |
|-------------------|-----------------|---------------------------------|-----------------|-----------|----------------|
| Name (Print/Type) | Brion P. Heaney | Registration No. Attorney/Agent | 32,542          | Telephone | (703) 243-6333 |
| Signature         |                 | Date                            | 3 DECEMBER 2003 |           |                |

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